

CERBN011.doc

10

**We Claim:**

1. An optical switch comprising:

at least a first demultiplexer for demultiplexing a series of wavelength division multiplexed signals into corresponding spatially separated demultiplexed signals;

5 a series of first optical to electronic interface units interconnected to said spatially separated demultiplexed signals, including:

optical to electronic conversion means for converting input optical signals to corresponding electrical signals;

10 data and clock recovery means for recovery of data and corresponding clocking information from said electrical signal and outputting said data as a first data stream, said data and clock recovery means being able to recover data streamed at multiple different clock rates; an electronic switch for transmitting said data stream to one of a series of output ports under the control of an external control signal;

a series of second electronic to optical interface units at said output ports, including:

15 data and clock recovery means for recovery of data and corresponding clocking information from said electrical signal and outputting said data as a second data stream;

electronic to optical conversion means for said data stream to a corresponding optical stream; and

20 at least a first multiplexer interconnected to a plurality of optical interface units for multiplexing the optical stream of each interface unit together to form a combined optical data stream output.

2. A switch as claimed in claim 1 wherein the data and clock recovery means of said second electronic to optical interface units further includes a clock recovery means being able to recover data streamed at multiple different clock rates through the second electronic to optical interface units.

25 3. A switch as claimed in claim 1 wherein said electronic to optical conversion means comprises an externally modulated semiconductor laser having wavelength specific output characteristics.

CERBN011.doc

11

4. A switch as claimed in claim 1 wherein said electronic to optical conversion means comprises a directly modulated semiconductor laser having wavelength specific output characteristics.

5. An optical switch comprising:

5 at least a first demultiplexer for demultiplexing a series of wavelength division multiplexed signals into corresponding spatially separated demultiplexed signals;  
a series of first optical to electronic interface units interconnected to said spatially separated demultiplexed signals, including:

10 optical to electronic conversion means for converting input optical signals to corresponding electrical signals;

data and clock recovery means for recovery of data and corresponding clocking information from said electrical signal and outputting said data as a first data stream;

an electronic signal switch for transmitting said data stream to one of a series of output ports under the control of an external control signal;

15 a series of second electronic to optical interface units at said output ports, said second electronic to optical interface units including a laser array wavelength matched to the output wavelengths of a first multiplexer;

20 at least a first multiplexer interconnected to a plurality of electronic to optical interface units for multiplexing the optical stream of each interface unit together to form a combined optical data stream output.

6. A switch as claimed in claim 5 wherein said laser array comprises a fiber laser array.

7. A fault tolerant switching unit including a first and second switch each as set out in claim 1, each switch interconnected to the same first demultiplexing unit and first multiplexer so as to provide fault tolerant operation of said switch.

25